

REMARKS

Reconsideration of the restriction requirement is respectfully requested.

The examiner identified three groups of invention as follows:

Group I: Claims 1-12 drawn to a cover gas composition;

Group II: Claims 14 and 15, drawn to a method of protecting molten magnesium;

Group III: Claim 16, drawn to a method of extinguishing magnesium fire.

Applicant provisionally elects the claims of Group I.

Applicant traverses the restriction requirement and respectfully submits that there is unity of invention between the claims of Groups I and II.

PCT Rule 13.1 states that:

*"The International application shall relate to one invention only or to a group of inventions so linked as to form a single general inventive concept ("requirement of unity of invention")."*

Applicant respectfully submits that the claims of Groups I and II all relate to a single inventive concept, that is, the protection of a molten magnesium/magnesium alloy with a protective cover gas composition.

In view of the above, it is also respectfully submitted that the claims of Groups I and II also fulfill PCT Rule 13.2 which states in part:

*"...the requirement of unity of invention...shall be fulfilled only when there is a technical relationship*

*among those inventions involving one or more of the same or corresponding special technical features."*

Furthermore, PCT Rule 13.4 covering *dependent claims* states:

*"Subject to Rule 13.1, it shall be permitted to include in the same international application a reasonable number of dependent claims, claiming specific forms of the invention claimed in an independent claim, even where the features of any dependent claim could be considered as constituting in themselves an invention."*  
(emphasis added)

Accordingly, claim 14 is dependent on claim 1. Claims 15 and 16 are dependent on claim 7.

It should also be noted that during the International Preliminary Examination phase of this application no objection was made with regard to lack of unity of invention. See Box 3 of the International Preliminary Examination Report dated September 5, 2001.

The reason no objection was made appears to be because the claims of Groups I and II have a technical relationship involving one or more of the same or corresponding special technical features (PCT Rule 13.2) and that claim 16 is dependent on claim 7 (PCT Rule 13.4).

Furthermore, the search and examination of the claims of Group I would appear to overlap and encompass the field of search for the claims of Group II. The search of Group III should not impose a significant additional burden.

It is thus respectfully submitted that a simultaneous search for the claims of Groups I, II, and III can be made without a substantial increase of the search effort. It is believed that the guidelines of MPEP Section 803 as cited below should be followed:

*"If the search and examination of an entire application can be made without serious burden, the examiner must examine it on the merits, even though it includes claims to distinct or independent inventions."*

In addition to the restriction requirement, the examiner has maintained that claim 1 is obvious in view of U.S. Patent No. 5,115,868 to Dougherty, Jr. et al which discloses a fire extinguishing composition including a fluorine containing gas, relying on column 2, line 65 to column 3, line 33. Applicants disagree with the examiner's position.

There is an art recognized distinction between:

- (a) Preventing fires, and
- (b) Extinguishing fires.

Cover gas compositions used to prevent fires differ from fire extinguishing compositions in three significant respects.

1. Cover gas compositions generally contain a minimum amount of active inhibiting agent which is used to prevent fires. The present application claims an inhibiting agent of less than 1% by volume (claim 10), preferably less than 0.5% by volume (claim 11), more preferably less than 0.1% by volume

(claim 11) and exemplifies efficacy at 0.02% by volume (see Example 1 on page 7).

The desire to minimize the amount of active inhibiting agent is not merely economic. In magnesium foundries, fluorine containing active agents form hydrogen fluoride (HF). Increasing the amount of fluorine containing active agent dramatically increases HF formation. HF is highly undesirable in a magnesium foundry because it causes severe corrosion of foundry equipment including steel crucibles which contain the molten magnesium.

It is known, for example, that cover gas compositions containing 2% by volume sulphur hexafluoride (SF<sub>6</sub>) have resulted in severe corrosion problems. Also, serious injury can result from SF<sub>6</sub> compositions creating reaction products with steel that react explosively with molten magnesium. In contrast, fire extinguishing compositions contain significantly higher levels of active agent than a cover gas composition. This is because when a fire must be extinguished the larger concern is to put out the fire. The matter of preventing corrosion of foundry equipment becomes a much lesser concern.

2. Cover gas compositions are used as constant, small, quiescent flows of gas to prevent magnesium vaporisation and subsequent burning by producing a very thin layer on the order of approximately 1 micrometer of magnesium oxide and magnesium fluoride that is impervious to magnesium vapor.


The flow rate of cover gas compositions is therefore of fundamental importance to forming the required protective layer which affords good molten metal protection. In contrast, fire extinguishing compositions are intended for delivery as a huge rush of gas to extinguish a fire quickly and hence are clearly unsuitable for a cover gas composition.

3. Cover gas compositions are used at low pressures, for example, 10-25% above atmospheric pressure. In contrast, fire extinguishing compositions are used at significantly greater pressure and hence are clearly unsuitable as a cover gas composition.

Accordingly, reconsideration of the restriction requirement is respectfully requested and reconsideration and withdrawal of Dougherty et al is respectfully requested.

Respectfully submitted,

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Charles B. Rodman, Reg. No. 26,798  
Attorney for Applicants

RODMAN & RODMAN  
7 South Broadway  
White Plains, New York 10601

Telephone: (914) 949-7210  
Facsimile: (914) 993-0668  
743-05